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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/868,845	09/07/2001	Juergen Rolf Mueller	0179-0170P	6312
2292	7590	05/07/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			STOCK JR, GORDON J	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 05/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/868,845

Applicant(s)

MUELLER, JUERGEN ROLF

Examiner

Gordon J Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-41 and 43-46 is/are rejected.
- 7) ☒ Claim(s) 42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the means for variation of the convergence of a bundle of rays (from claim 42) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawing corrections filed January 8, 2004 have been accepted by the Examiner.

Claim Objections

3. **Claim 42** is objected to for the following: "those bundle of rays" lacks antecedent basis. Correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 25-28, and 31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. The term "extent" in **claims 25 and 31** is a relative term which renders the claim indefinite. The term "extent" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be

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reasonably apprised of the scope of the invention. The term, "extent," renders the volume indefinite, for it is unclear as to how many dimensions comprise the extent in the direction of the respective optical axes. **Claims 26-28** are rejected for being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 23, 25, 29-37, 39-41, 43-44, 46** rejected under 35 U.S.C. 103(a) as being unpatentable over **Ouderkirk et al. (6,181,474)** in view of **Scherübl et al. (WO 98/44375)** and in view of **Picard (WO 95/00871)**.

As for **claims 23, 25, 29-37, 39-41, 43-44, and 46**, Ouderkirk discloses in a scanning confocal microscope with objective lens position tracking: scanning the sample with a measuring volume using a confocal device with two radiation sources and two separate objectives; receiving measuring values of optical parameters; the sample maintains its position relative to the support; an auxiliary focus from the secondary radiation source and separate objective is generated; collimating both beams; detecting a retroreflection via two detectors with two diaphragms; whereas, a position is determined (height measurements); the objective lens positions are adjusted (Figs. 3a-3d; 10 and 11; column 20); the extent of the detected volume is smaller than the extent of the measuring volume suggested by the measuring volumes in regards to 5 of Fig. 10 and 18 and 19 of Fig. 10; the readjustment to get a maximum intensity of the two

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different foci suggested by Fig. 11; and laterally and axially adjusting foci are accomplished via scanning the surface and Ouderkirk suggests that the periodic movement of the auxiliary focus is similar to the extent of the other foci's measuring volume (Fig. 10); intensities detected by two detectors and a position is determined by distribution of intensities (Figs. 10 and 11); scatter light intensity may be detected (col. 13, lines 50-65). As for the sample being inspected and investigated, Ouderkirk discloses that electronic devices are inspected (col. 1, lines 1-15). Scherübl and Picard both disclose that confocal microscope systems are used for three-dimensional imaging and wafer inspection (abstract of Picard; pages 2-4 of translation of Scherübl). Therefore, it would be obvious to one skilled in the art to have the sample comprise a particle built up from inorganic material such as a semiconductor wafer, for wafers are inspected by confocal systems. As for separating structures after the scanning process, Scherübl also teaches the separation of wafer planes to detect semiconductor structures (abstract). Lastly, a support for the sample is provided (5 of Fig. 10).

9. **Claims 24, 38, 45** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Scherübl et al. (WO 98/44375)** in view of **Picard (WO 95/00871)**.

As to **claims 24, 38, and 45**, Scherübl in a confocal microscope device discloses the following: scanning with a measuring volume using at least one apparatus being confocal with a first radiation source and at least one objective thereby receiving measuring values for characterization of sample; substantially maintaining its position; generating during the scanning step an auxiliary focus by means of at least two secondary radiation sources and an optic which is the same objective whereas the auxiliary foci are at different spatial relations to the sample due to differing focal points through chromatic aberration ; collimating the three radiation sources

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prior to hitting 3 and 4 of Fig. 8; detecting a retroreflection from all three foci by a detector having a confocal arranged diaphragm; generating the auxiliary focus and retroreflection is used for measuring the position of the interface and adjusting positions of the foci relative to measuring volume through autofocusing (abstract, Fig. 8, pages 12-17 of translation). As for a support the figures of Scherübl disclose just an object plane; however, the object is scanned through the use of an x-y table (page 13, lines 20-21 of translation). As for the sample being studied, a wafer is being inspected for defects and profile imaging may be used in confocal imaging (pages 2-4 of translation). And Picard teaches three-dimensional imaging of samples (abstract). Therefore, it would be obvious to one skilled in the art that a particle built up from inorganic materials would be detected for semiconductor wafers are being inspected. And would be obvious to one skilled in the art to optically detect at least some of the other entities of the group for the entities are three dimensional and three dimensional imaging may be accomplished via confocal imaging. In addition, there is taught in Scherübl a slit and aperture means in the intermediate image plane (5 and 11 of Fig. 8).

Allowable Subject Matter

10. **Claim 42** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. **Claims 26-28** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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12. As to **claim 26**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for optically detecting at least one entity the auxiliary focus is generated by a second objective having a numeric aperture which is larger than the numeric aperture of the first objective used for generating the measuring volume, in combination with the rest of the limitations of **claim 26**.

As to **claim 27**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in method for optically detecting at least one entity wherein a smaller part of the numerical aperture of a common optic or the respective optics is used for generating the measuring volume than for generating the auxiliary focus, in combination with the rest of the limitations of **claim 27**.

As to **claim 28**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for optically detecting at least one entity a confocal arranged diaphragm is used at the detection of the auxiliary focus and said diaphragm having a smaller opening than a confocal arranged diaphragm used at the detection of the measuring volume, in combination with the rest of the limitations of **claim 28**.

As to **claim 42**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an apparatus means for variation of the convergence, in combination with the rest of the limitations of **claim 42**.

Response to Arguments

13. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

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Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

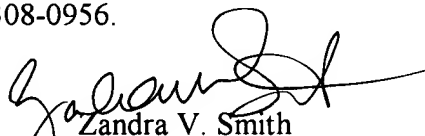
Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431. The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


gs

May 3, 2004


Zandra V. Smith
Primary Examiner
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